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Does CEO compensation impact patient satisfaction

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Does CEO Compensation Impact Patient Satisfaction?

Introduction

Public scrutiny of, and interest in, executive compensation has recently gained some momentum in nonprofit healthcare organizations (Carreyrou & Martinez, 2008; Firstenberg & Lane, 2011; Tieman, 2002). The scrutiny often becomes pronounced particularly when the organization is struggling and there are questions about performance (Hundley, 2010; Waldman, 2008). In Ontario, Canada, the issue of executive compensation in healthcare organizations has become a headline-grabbing topic (see, for example, Perkins & Howlett, 2011). The annual ritual of the publication of the ‘sunshine list’ – the list of public-sector employees who earn \$100,000.00 or more – often fuels public discourse of the appropriate level of compensation for executives.

Inevitably, public scrutiny has triggered interests in performance-based pay in healthcare organizations (Berwick et al., 2003; Jha et al., 2012; Rosenthal et al., 2006). Moreover, exacerbated by the effects of the recession of 2008, the need to cap compensation of executives in nonprofit healthcare organizations has also been raised (Matolcsy & Wright, 2011; Wangness, 2009). In response to the public scrutiny, the government of Ontario, Canada enacted legislation in 2010 to link executive compensation to the achievement of quality performance improvement targets ("The Excellent Care for All Act," 2010). While this legislation provides a broad guideline to link executive compensation to performance, the relationship between executive compensation and patient satisfaction performance in healthcare organizations in Ontario is unknown.

Accordingly, this research examines the relationship between hospital CEO compensation, clinical outcome metrics and patient satisfaction performance of hospitals in Ontario, Canada. Specifically, the research investigates three pertinent and related questions: Does CEO compensation affect patient satisfaction? Does CEO compensation play a mediating role between patient satisfaction and hospital

size? Other than CEO compensation, what factors impact patient satisfaction? The study provides a basis for a future comparative analysis of the link between executive compensation and the performance of the hospitals before and after the enactment of the 2010 legislation that attempts to link executive compensation to the achievement of quality performance goals of the organizations.

While a number of studies have found evidence suggesting a negative correlation between hospital size and measures of patient satisfaction ([Pink et al., 2003](#); [Young et al., 2000](#)), and others have found a positive correlation between hospital size and CEO compensation ([Kramer & Santerre, 2010](#); [Preyra & Pink, 2001](#); [Reiter et al., 2000](#); [Santerre, 1993](#)), no research has examined the relationship between hospital CEO compensation and patient satisfaction performance. This gap in the research is what this study attempts to bridge.

Patient satisfaction is critical for all health care management ([Otani et al., 2010](#)). The goal of patient satisfaction needs to permeate health care organizations and be of major concern to hospital Chief Executive Officers (CEO). In nonprofit hospitals, patient satisfaction performance measures are particularly critical to the mission of the organization ([Pink et al., 2003](#); [Young, 2005](#)). The focus on patient satisfaction is consistent with the perspective of Porter (2010, p. 2477), who argues that “Value should always be defined around the customer, and in a well-functioning health care system, the creation of value for patients should determine the rewards for all other actors in the system”. A recent article in the Wall Street Journal claiming that, “Nearly \$1 billion in payments to hospitals over the next year will be based in part on patient satisfaction” ([Adamy, 2012](#)), highlights the timeliness of this research.

CEOs, as management leaders, bear ultimate responsibility for patient satisfaction. A study by [Maulik and Hines \(2006\)](#) reports that approximately two-thirds of the hospitals they surveyed in 14 states in the United States included patient surveys in board quality activities and that a mean of 15% of CEO

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variable compensation was linked to quality. Maulik and Hines (2006) lamented that one third of hospitals did not provide CEOs with incentives related to patient satisfaction survey results.

Current research has examined determinants of hospital CEO pay (Pink & Leatt, 1991; [Santerre, 1993](#)), and the relationship with financial performance ([Brickley & Van Horn, 2002](#); [Reiter et al., 2009](#)). Even though financial performance is critical to the survival of nonprofit healthcare organizations and is one of the important measures of the organization ([Ackerman et al., 2005](#); [Reiter et al., 2009](#)), questions about patient satisfaction are particularly relevant in healthcare organizations.

In this study, we take a decidedly mission-focused approach suggesting that the multiple indicators of performance and the impact of social drivers ([Akingbola, 2012](#); [Baum & Oliver, 1996](#); [Crittenden, 2000](#)) are perhaps best analyzed by focusing on observable mission-relevant performance measures.

New Contribution

This research makes two important contributions. First, it applies the constructs of strategic compensation to the context of healthcare organizations in Ontario by examining the link between executive compensation and patient satisfaction performance of hospitals. Due to the labor-intensive nature of healthcare services, it is not uncommon for labour cost to account for more than 50 percent of the budgets of healthcare organizations ([Altman et al., 1990](#); [Fottler, 2008](#)). In an era of sky rocketing healthcare costs ([Di Matteo, 2010](#)), demand for innovation ([Jack & Phillips, 1993](#)) and the challenge of increased demand for healthcare ([Devlin & Sarma, 2008](#); [Young, 2005](#)), executive compensation is part of the debate on sustainability of healthcare funding. Hence, the relationship between executive compensation and performance is particularly relevant in the discussion of how healthcare organizations

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3 deliver value. Second, this study lays a foundation for pre and post comparative analysis of the effects of
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5 the executive compensation legislation passed in 2010.
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9 Next, the paper presents an overview of the theoretical perspectives that have been used to explain CEO
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11 compensation in general and in nonprofit healthcare organizations in particular. Then, a model is
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13 presented followed by the description of the data and methodology. This is then followed by the analysis
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15 of the results. It concludes with possible opportunities for future research and implications for
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17 policymakers.
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20 21 **Theory/Conceptual Framework**

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23 There has been broad research interest in executive compensation, particularly the relationship between
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25 the compensation of chief executive officers and the performance of the organization across industries
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27 ([Chalmers et al., 2006](#); [Gibbons & Murphy, 1990](#); [Hermalin & Wallace, 2001](#); [Jensen & Murphy, 1990](#);
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29 [Matolcsy & Wright, 2011](#); [Mehran, 1995](#); [Nourayi & Daroca, 2008](#)). While this interest has been
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31 generated in part by questions about the principal-agent problems, a situation in which the self-interests
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33 of the executives are incongruent with the interests of shareholders ([Eisenhardt, 1989](#)), the increasing
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35 public concern with whether the compensation of CEOs is consistent with organizational performance
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37 has also contributed to the intense scrutiny and research interest.
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43 The pervasive public scrutiny and the resulting research interest in executive compensation have
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45 generated questions underpinned by several theoretical foundations. Generally, the theories that have
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47 been used to explain CEO compensation have been classified into two main strands, economic and non-
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49 economic theories ([Tosi & Greckhamer, 2004](#)). Economic theories such as agency theory seek to
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51 explain the content, variability and relationship between executive compensation and firm performance
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53 in terms of agency problems ([Agrawal & Mandelker, 1987](#); [Akhigbe et al., 1995](#); [Jensen & Murphy,](#)
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55 [1990](#)). For example, [Gomez-Mejia et al., \(1987\)](#) found that when stockholders are dominant, the
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compensation of CEO tends to reflect the performance of the firm. This suggests that the nature and strength of governance affects CEO compensation. In the same vein, [Core et al., \(1999\)](#) found a negative relationship between CEO compensation, firm performance and governance structure. Their findings indicate that CEOs in firms with a weak governance structure receive higher compensation and that the firms have poor performance.

Non-economic theories such as justice theory ([Jasso & Milgrom, 2008](#)), social comparison theory (O'Reilly et al., 1988) and power theory ([Finkelstein & Hambrick, 1989](#)), provide an alternative lens to examine and explain CEO compensation. These and other theories highlight the role of factors such as culture, social network, and power in CEO and executive compensation ([Boxman et al., 1991](#); [Brick et al., 2006](#); [Tosi & Greckhamer, 2004](#)). For example, the study by O'Reilly et al. (1988) found that rather than economic factors such as firm performance and human capital measures, CEO pay was better predicted by the pay of members of the compensation committee. In their study of for-profit firms, [Brick et al. \(2006\)](#) found evidence of cronyism as a factor in the excess compensation of the CEO and director. This finding and the work of [Tosi and Greckhamer \(2004\)](#) on cultural dimensions of CEO compensation illustrate the importance of non-economic social factors in the discussion of CEO compensation. Non-economic theories emphasize that the social factors of the organization are equally critical to understand the compensation of the CEO.

One context in which social factors and non-financial performance are particularly discernible is in nonprofit organizations. HR practices including CEO compensation in nonprofits are subject to the test of social mission ([Akingbola, 2006](#)). Other characteristics of nonprofits such as the non-distribution of net earnings to individuals who control the organization (Hansmann, 1980), and the involvement of multiple stakeholders and funders ([Akingbola, 2006](#); [R. Smith & Lipsky, 1993](#)), are also relevant in the

analysis of CEO compensation. However, the limited research on CEO compensation in nonprofit hospitals apparently draws more on economic indicators than social factors and outcomes.

A number of studies have examined the relationship between CEO compensation and the financial performance of nonprofit hospitals. Pink and Leatt (1991) examined management compensation in nonprofit hospitals in Ontario, Canada. They found a weak relationship between hospital management compensation and the financial performance of the hospitals. In addition, they concluded that hospital management compensation was determined by size and teaching status. Using the same Ontario, Canada context, Preyra and Pink (2001) and Reiter et al. (2009) also analyzed CEO compensation and financial performance of hospitals, but through different lenses. Preyra and Pink (2001) found that hospital CEOs were being rewarded for financial performance but the variable component of the total compensation was significantly less than that of for-profit CEOs. In their study, [Reiter et al. \(2009\)](#) found no relationship between CEO pay and financial performance of hospitals.

Few studies have added non-financial indicators to analyze CEO compensation in nonprofit hospitals (see, [Bertrand et al., 2005](#); [Brickley & Van Horn, 2002](#); [Kramer & Santerre, 2010](#)). However, these studies have two major limitations. First, they seem to emphasize financial measures over non-financial performance measures. The non-financial performance measures seem to be an add-on to the primary objective of the research. Hence, the studies have not entirely reflected the importance of non-financial factors. Second, as Kramer and Santerre (2010) noted, the studies adopted weak measures of non-financial performance.

Methodology

Research Design

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We examined the relationship between CEO compensation and hospital patient satisfaction building on the results of five linear regression models and a Sobel-Goodman test (Ender, 2012). In our first model, the dependent variable was total CEO compensation, in constant 2002 Canadian dollars, paid by hospitals in Ontario in calendar years 2004, 2005, and 2006. CEO compensation was modeled using the number of acute care beds; year fixed effects; whether or not the CEO managed one or multiple site hospitals; and hospital type (teaching, community, small). The latter two variables were used as proxies for management complexity. The number of acute care beds was used as a measure of institutional size. This variable arguably underlies some of the other measures of hospital size such as patient-days or number of FTE employees used in related research.

In two subsequent models, the dependent variable was a composite patient satisfaction scale for a hospital for years 2005, 2006, and 2007, and the independent variable of interest was the previous year's CEO compensation. The assumption underlying the lag in patient satisfaction relative to CEO compensation was that changes implemented by a CEO must occur prior to their impact on clinical outcomes and patient satisfaction performance. Lagging patient satisfaction by one year eliminated the risk of endogeneity, permitting CEO compensation to influence patient satisfaction, but not the reverse. We controlled for year fixed effects; whether or not the hospital consisted of one or multiple sites; hospital type (teaching, community, or small); and clinical outcome measures. Previous research has suggested that fewer adverse clinical outcomes positively influence patient satisfaction ([Kane, Maciejewski, & Finch, 1997](#)). Our sample size was too small to consider hospital fixed-effects.

In the final two models, the dependent variable was also the composite satisfaction scale, but the independent variable of interest was hospital size as measured by the number of acute care beds. Since the number of acute care beds appeared so influential in the calculation of CEO turnover and compensation ([Brickley & Van Horn, 2002](#); [Kramer & Santerre, 2010](#)), we wanted to determine if this

component of compensation was also explanatory in patient satisfaction performance. Again, we controlled for year fixed effects; whether or not the hospital consisted of one or multiple sites; hospital type (teaching, community, or small); and clinical outcome measures.

Patient satisfaction was selected as the performance measure, while system integration and financial measures were not taken into account. According to P. C. Smith and Street (2007), financial expenditures may be considered inputs, but non-market outputs should form the basis of performance measures in non-profit health care.

Sample and Data

The sample of hospital CEOs was drawn from the annual Ontario Public Sector Salary Disclosure database ("Public Sector Salary Disclosure Act," 1996). This database discloses compensation information of public sector employees and of employees of organizations that receive public funding from the provincial government, who earn \$100,000.00 or more before taxes, but after including the value of the total taxable benefits. Performance data were drawn from the database of the Hospital Report Research Collaborative (HRRC), which is now under the auspices of the Health System Performance Research Network (HSPRN). The database contains performance measurements in patient satisfaction, systems integration (availability of clinical information and utilization of data), clinical outcomes (readmissions and adverse events), and finances (ratios).

A convenience sample of acute care hospitals in Ontario was used in this research. The sample combined the clinical outcome and patient satisfaction data of the province's Hospital Report: Acute Care for three years (2005, 2006, 2007) with the corresponding hospital's total CEO compensation for each of the previous years (2004, 2005, and 2006) published on the Ontario Ministry of Finance website ("Public Sector Salary Disclosure Act," 1996). Potential biases exist in the sample due to exclusion of those hospitals for which no Hospital Report: Acute Care data was reported, or for which no CEO

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compensation data was available, or both. In the case of CEO compensation, the most probable reason for exclusion of a particular hospital was that nominal CEO compensation was less than \$100,000 throughout the years 2004 to 2006, inclusive. Compensation data was also excluded in those years in which a hospital had two or more CEOs during the same year, or it appeared a new CEO began or ended his or her tenure part way through the year. Real CEO compensation was used in this study and was calculated by deflating nominal CEO compensation by the annual Canadian consumer price index (2002 = 100) published by Statistics Canada (2010).

Descriptive Statistics

The sample consisted of 261 CEO-hospital-year observations. The number of acute care hospitals in the sample was 103 and the number of years was 3. Each acute care hospital had between 1 and 6 sites with a mean of 1.5 sites. Of the 103 hospitals in the sample, 10 were categorized as teaching hospitals with a mean of 582 beds, 31 were categorized as small hospitals with a mean of 35 beds, and 62 were categorized as community hospitals with a mean of 257 beds.

The distribution of number of acute care beds per hospital in 2006 (Inventory of Critical Care Service: An Analysis of LHIN-Level Capabilities) is positively skewed. The number of acute care beds ranged from a minimum of 6 to a maximum of 908, with a mean of 222 beds. Almost half of the hospitals (49 out of 103) had fewer than 100 acute care beds.

The distribution of annual CEO compensation observations is positively skewed. Average annual CEO compensation for the 261 CEO-hospital-year observations ranged from \$94,723.50 to \$648,740.40 in constant 2002 dollars, with a mean observed CEO compensation of \$232,020.80. Over half (137 of 261) of the CEO compensation observations were below \$200,000 (constant 2002 dollars). Note that nominal CEO salaries below \$100,000 per year were excluded from the data.

The natural logarithm of annual CEO compensation was determined to be closest to a normal distribution for this variable. Generally, a logarithm is used in linear regressions of CEO compensation (Core et al., 1999). The square root of the number of acute care beds per hospital in 2006 was used as a proxy for the size of the hospital (*Inventory of Critical Care Service: An Analysis of LHM-Level Capabilities*, 2006). This is consistent with similar research on CEO compensation and firm size (Baker & Hall, 2004; Schaefer, 1998). Similarly, reported clinical outcome measures were transformed by taking their natural logarithms, thereby generating more normal distributions.

The four measures of patient satisfaction that were collected in each of the three years were examined to see if they could form a composite measure of performance. The four measures consisted of patients' perceptions of their overall hospital experience (overall impression), "including the overall quality of care and services they received at the hospital, and their confidence in the doctors and nurses who cared for them"; perceptions regarding the amount and quality of information (communication) they received "about their condition, treatment, and preparation for discharge and care at home, and whether they felt family and friends were given sufficient information"; perceptions regarding the respect, dignity, and courtesy they received (consideration); and perceptions of the degree of coordinated and integrated care they received (responsiveness).

These four measures of satisfaction were truncated at 100% and all were found to have leptokurtic distributions. In addition, three of the four measures were negatively skewed. Accordingly, the four measures of satisfaction were transformed to increase normality, using Stata's 'ladder' function (StataCorp, 2011). The four measures were then standardized (mean 0, standard deviation 1). Table 1 suggests that the four normalized and standardized measures of patient satisfaction are very significantly correlated.

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Because the patient satisfaction variables were so highly correlated, they were examined to see if they could be combined into a single patient satisfaction scale and obviate problems of multicollinearity in our models. Cronbach’s alpha was calculated using Stata (StataCorp, 2011) to measure internal consistency based on average correlation among all four measures of perceived satisfaction for each year. It was determined that internal consistency, a measure of reliability, was maximized when the three standardized variables, overall impression, consideration, and responsiveness were used to generate a single satisfaction scale for each year. The scale reliability coefficient was 0.98, which is generally considered excellent for a three-item scale.

Results

Does CEO Compensation impact hospital patient satisfaction?

Initially, our evidence suggested that hospital patient satisfaction is negatively impacted by CEO compensation. Model I in Table 2 shows the results of a linear regression of the patient satisfaction scale onto CEO compensation and a number of control variables and suggests that these variables can explain about one third of the variation ($\text{Adjusted } R^2 = 33.81\%$) in patient satisfaction performance. CEO compensation was measured as the natural logarithm of total compensation in constant 2002 dollars. Model I also shows that the standardized clinical outcome measures do not appear to impact patient satisfaction. Variables for fixed year effects, multi- or single-site, rate of unplanned readmissions for specific medical conditions and rate of unplanned readmissions for labour and delivery were found not to be significant in Model I.

Model II in Table 2 presents the results of applying a stepwise method on Model I, using backward elimination of the least significant (highest p-value > 0.05) variables, one at a time. As variables were eliminated, some additional observations were introduced. These additional observations were not

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3 included in prior regressions as the data was missing for the previously eliminated variables. The
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5 stepwise method was halted once all remaining variables were significant to $p < 0.05$.
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9 Model II in Table 2 suggests over half of the variation in patient satisfaction (Adjusted $R^2 = 53.35\%$)
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11 may be explained by variation in CEO compensation and a few control variables. Control variables for
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13 whether a hospital was community, small, or teaching, were found to be significant in explaining patient
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15 satisfaction performance. The results indicated that patient satisfaction was highest in teaching hospitals
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17 and did not significantly vary during the period under study. Whether a hospital was a single- or multi-
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19 sited facility did not appear to affect patient satisfaction.
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26 *Delving further, excluding the CEO compensation variable, what impacts patient satisfaction?*
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29 It appears that patient satisfaction is primarily negatively impacted by hospital size, as measured by
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31 number of acute care beds, when the CEO compensation variable is excluded. The square root of the
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33 number of acute care beds was used as a proxy for hospital size. Model III in Table 3 suggests that the
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35 number of acute care beds and a few control variables can explain much of the variation (Adjusted $R^2 =$
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37 44.19%) in patient satisfaction, in the absence of CEO compensation. Variables for fixed year effects,
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39 multi- or single-site, rate of adverse events for labour and delivery, rate of unplanned readmissions for
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41 specific medical conditions, and rate of unplanned readmissions for labour and delivery were found to
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43 not be significant in Model III.
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48 Model IV in Table 3 presents the results of the application of a stepwise method on Model III using
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50 backward elimination, eliminating the least significant (highest p-value > 0.05) variables one at a time.
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52 As variables were eliminated, some additional observations were introduced. These additional
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observations were not included in prior regressions as the data was missing for the previously eliminated variables. The stepwise method was halted once all remaining variables were significant to $p < 0.05$.

Model IV in Table 3 again presents patient satisfaction to be a decreasing function of number of acute care beds, but with an improved goodness of fit (Adjusted $R^2 = 61.77\%$) over Model III. Variables indicating whether a hospital was single- or multi-site, community or teaching, and number of acute care beds were found to be significant in explaining patient satisfaction performance. The regression results also indicate that patient satisfaction did not significantly vary during the period under study. Whether a hospital experienced adverse clinical outcomes, such as a high rate of adverse labour and delivery events or a high rate of re-admissions, did not appear to affect patient satisfaction.

--- Insert Table 3 about here ---

Does hospital size, as measured by number of acute care beds, also impact CEO compensation?

Yes, perhaps not surprisingly, CEO compensation is shown to increase on increasing number of acute care beds (positive coefficient). A linear regression of CEO compensation onto the number of acute care beds and categorical variables suggests that these variables can explain most of the variation (Adjusted $R^2 = 86.44\%$) in CEO compensation. Categorical variables were added to distinguish between the three years under study and to factor in management complexity. Dichotomous variables designating whether a hospital was a single site or was multi-sited, and whether a hospital was community, small, or teaching were used as proxies for management complexity.

--- Insert Table 4 about here ---

Model V in Table 4 depicts the results of a linear regression of CEO compensation onto the number of acute care beds and categorical variables. In addition to the number of acute care beds, all of the other independent variables are also significant in the linear regression of CEO compensation. The largest

coefficient is that of the constant, 12.097, which contributes \$179,333 (constant 2002 dollars) to CEO compensation. The categorical variables suggest that CEO compensation was less in 2004 than in 2005 ($-0.066 < -0.058$, lagged one year), and less in 2005 than in 2006 ($-0.058 < 0$, reference year lagged by one). It also appears that CEO compensation was less for multi-sited hospitals than for single-sited hospitals (negative coefficient: -0.069), suggesting that this categorical variable was perhaps not an effective proxy for management complexity. The categorical variables for hospital type suggest that CEO compensation was less for a community hospital than for the reference teaching hospital ($-0.432 < 0$), and less for a small hospital than for a community hospital ($-0.629 < -0.432$). Based on Model V in Table 4, the predicted 2006 CEO compensation for a reference single-sited, average size 582-bed acute care teaching hospital in constant 2002 dollars would be \$573,670, while that for a small 35-bed multi-site hospital would be \$118,676.

These findings suggest that the relationship between patient satisfaction and CEO compensation are both dependent on the size of the hospital. Increasing the number of acute care beds appears to simultaneously increase CEO compensation while decreasing patient satisfaction. This raised the question of whether CEO compensation has any effect at all on patient satisfaction, independent of hospital size.

Given that hospital size impacts both patient satisfaction and CEO compensation, does CEO compensation play a mediating role between hospital size and patient satisfaction?

No, there does not appear to be any statistically significant mediating role played by CEO compensation. Figure 1 depicts the outcome of Sobel-Goodman tests indicating that CEO compensation does not significantly influence ($p > 0.10$) patient satisfaction independently of the number of acute care beds. The tests suggest that the addition of CEO compensation as a mediator variable does not affect the significance of the number of acute care beds and moderator variables in explaining patient satisfaction.

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3 The Sobel-Goodman tests were executed using the *sgmediation* command written for Stata (StataCorp,
4 2011) by Ender (2012). While hospital size appears to impact both CEO compensation (positively) and
5 patient satisfaction (negatively), there does not appear to be impact on patient satisfaction attributable to
6 CEO compensation.
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16 **Discussion**

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18 Patient satisfaction and clinical outcomes are central to the mission of nonprofit hospitals. However, the
19 impact of hospital CEO compensation on patient satisfaction and clinical outcome performance are
20 unknown. Does CEO compensation affect patient satisfaction? Does CEO compensation play a
21 mediating role between patient satisfaction and hospital size? Other than CEO compensation, what
22 factors impact patient satisfaction? These are some of the relevant
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24 questions that are yet to be examined in the literature, but which are explored in this research. Research
25 on nonprofit organizations has emphasized that although the financial performance is important, it is not
26 the key indicator of the effectiveness of the organization ([Akingbola, 2012](#); [Brown & Yoshioka, 2003](#);
27 [Weisbrod, 1998](#)). Instead, it is argued that the essential indicator of performance is the extent to which
28 nonprofits achieve their mission ([Herman & Renz, 2004](#); [Moore, 2000](#)). Thus, it is surprising that
29 previous studies on nonprofit hospital CEO compensation have focused mainly on financial performance
30 when for these hospitals, patient satisfaction is central to the mission and should drive value creation and
31 reward ([Porter, 2010](#)).
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50 The findings of this research suggest that patient satisfaction performance in hospitals in Ontario is not
51 impacted by CEO compensation. This is supportive of the findings of O'Reilly et al. (2010) who suggest
52 that CEOs are perhaps too far removed from the patients they serve for CEO activity to impact patient
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3 satisfaction. Specifically, there was a negative, although insignificant, relationship between CEO
4 compensation and patient satisfaction measured as the overall impression of services received that
5 included quality of care, consideration, and responsiveness for each of the hospital-year period under
6 study. Not surprisingly, the research supports previous research, finding that the number of acute care
7 beds is related to CEO compensation in the hospitals. This coupled with the research findings on the
8 relationship between the classification of a hospital as community or teaching, whether a hospital has a
9 single or multi-site seems to suggest that these factors are more connected to patient satisfaction
10 performance than CEO compensation.
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22 Although previous studies have not specifically examined the relationship between CEO compensation
23 and patient satisfaction in nonprofit hospitals, our findings have links to current literature. Comparable
24 to [Jha et al. \(2012\)](#) finding no pay-for-performance relationship with clinical outcomes, our findings
25 suggest that there was no difference in patient satisfaction performance based on variation in CEO
26 compensation. Moreover, the findings appear to support similar studies that found that there is less
27 focus on non-financial performance such as charitable performance than on financial performance in
28 determining CEO compensation ([Brickley & Van Horn, 2002](#); [Kramer & Santerre, 2010](#)). The finding
29 on the relationship between number of acute care beds and CEO compensation is consistent with an
30 extensive body of literature on executive compensation and organizational size in both nonprofit and
31 for-profit organizations ([Hallock, 2002](#); [George H. Pink & Leatt, 1991](#)).
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47 From a policy perspective, these findings appear to suggest there was no link between CEO
48 compensation and patient satisfaction performance of hospitals in Ontario prior to the enactment of the
49 Excellent Care for All legislation ("The Excellent Care for All Act," 2010), which was enacted in part to
50 link executive compensation to the achievement of quality performance improvement targets. Most
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importantly, the findings provide a foundation for policymakers to use to assess the impact of the new legislation on patient satisfaction performance.

Conclusion

This research examines the relationship between hospital CEO compensation, clinical outcomes and patient satisfaction performance of hospitals in Ontario, Canada. The results of this study generally indicate that patient satisfaction, as a measure of performance, is unrelated to hospital CEO compensation in Ontario, independent of hospital size. Increasing hospital size positively affects CEO compensation while negatively impacting patient satisfaction. It may simply be that CEOs are too far removed from the patients they serve for CEO actions to impact patient satisfaction (see, for example, Rozenblum et al., 2012).

There are several limitations to this study. First, observations of CEO-hospital-years in which annual nominal CEO compensation was below \$100,000 were excluded, as they were not publicly available. Accordingly, the number of small and the number of multi-sited hospitals may be under-represented in the sample. This could mean that the research results are more indicative of compensation relationships associated with more experienced and urban-centred CEOs and less so for CEOs in rural centres or at the beginning of their careers. Similarly, the exclusion of those CEO-hospital-years in which a hospital changed CEOs suggests that the results are more indicative of those hospitals with lower CEO turnover than those with higher CEO turnover.

Second, this research was limited to a three-year range. Patient satisfaction performance and adverse clinical outcomes measures for hospitals were restricted to the years 2005 through 2007, inclusive, and associated with the prior years' CEO compensation. Accordingly, the findings may not be indicative of current relationships between the variables or of those relationships in prior periods.

Third, this study related the compensation of individual CEOs to a measure of performance based on a multitude of patient satisfaction surveys. Understandably, the satisfaction of all the patients surveyed is affected by the contributions of numerous hospital clinicians and support staff, as well as other factors not captured here. Finally, this research is restricted to not-for-profit hospitals in Ontario, Canada. The relationships between the variables presented in this study may therefore not be indicative of correlations in other not-for-profit jurisdictions. Also, as a fundamental assumption in this study was that the level of patient satisfaction is the most appropriate measure of performance to be maximized, the findings are not likely to be replicable in CEO compensation studies of hospitals where profit is the performance measure being maximized.

The results of this research suggest that, in general, CEO compensation levels do not directly impact patient satisfaction. It appears that CEO compensation, as an input, is determined by many other financial and non-financial inputs that play a more significant role. It is possible that patient satisfaction performance can be improved if CEO compensation is more contingent on this outcome. However, further research is needed to understand the instruments by which CEOs could affect this performance measure.

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Table 1: Pearson (pairwise) correlations of patient satisfaction items

	Overall Impression	Communication	Consideration	Responsiveness
Overall Impression	1			
Communication	0.8718***	1		
Consideration	0.9583***	0.8809***	1	
Responsiveness	0.9244***	0.8758***	0.9632***	1

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$

Table 2: Linear regression of patient satisfaction performance on CEO compensation ^{a, b}

Independent variables	Model I	Model II
Constant	1.009*** (0.273)	1.107*** (0.199)
CEO compensation	- 0.755*** (0.102)	- 0.755*** (0.077)
Year 2005 relative to 2007	- 0.050 (0.162)	
Year 2006 relative to 2007	0.063 (0.147)	
Multi-site	0.067 (.115)	
Community hospital relative to teaching	- 1.122*** (0.244)	- 1.188*** (0.195)
Small hospital relative to teaching	- 1.076* (0.467)	- 0.683* (0.285)
Rate of adverse events for labour and delivery	0.103 (0.065)	
Rate of unplanned readmissions for specific medical conditions	0.062 (0.071)	
Rate of unplanned readmissions for specific surgical procedures	- 0.096 (0.063)	
Rate of unplanned readmissions for labour and delivery	- 0.006 (0.075)	
Model statistics		
N	150	214
Adjusted R ²	0.3381	0.5335
F-statistic	8.61***	82.18***

^a Negative coefficients indicate the variable lowers the level of satisfaction. Standard errors are in brackets.

^b *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$.

Table 3: Linear regression of patient satisfaction performance on number of acute care beds ^{a, b}

Independent variables	Model III	Model V
Constant	0.600** (0.204)	0.484*** (0.084)
Number of acute care beds	- 0.800*** (0.084)	- 0.775*** (0.049)
Year 2005 relative to 2007	0.069 (0.147)	
Year 2006 relative to 2007	0.146 0.134	
Multi-site	0.403*** (.117)	0.414*** (0.099)
Community hospital relative to teaching	- 0.849*** (0.194)	- 0.682*** (0.095)
Small hospital relative to teaching	0.789* (0.395)	
Rate of adverse events for labour and delivery	0.082 (0.060)	
Rate of unplanned readmissions for specific medical conditions	0.055 (0.065)	
Rate of unplanned readmissions for specific surgical procedures	- 0.117* (0.058)	
Rate of unplanned readmissions for labour and delivery	0.016 (0.069)	
Model statistics		
N	150	214
Adjusted R ²	0.4419	0.6177
F-statistic	12.80***	115.73***

^a Negative coefficients indicate the variable lowers the level of satisfaction. Standard errors are in brackets.

^b *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$.

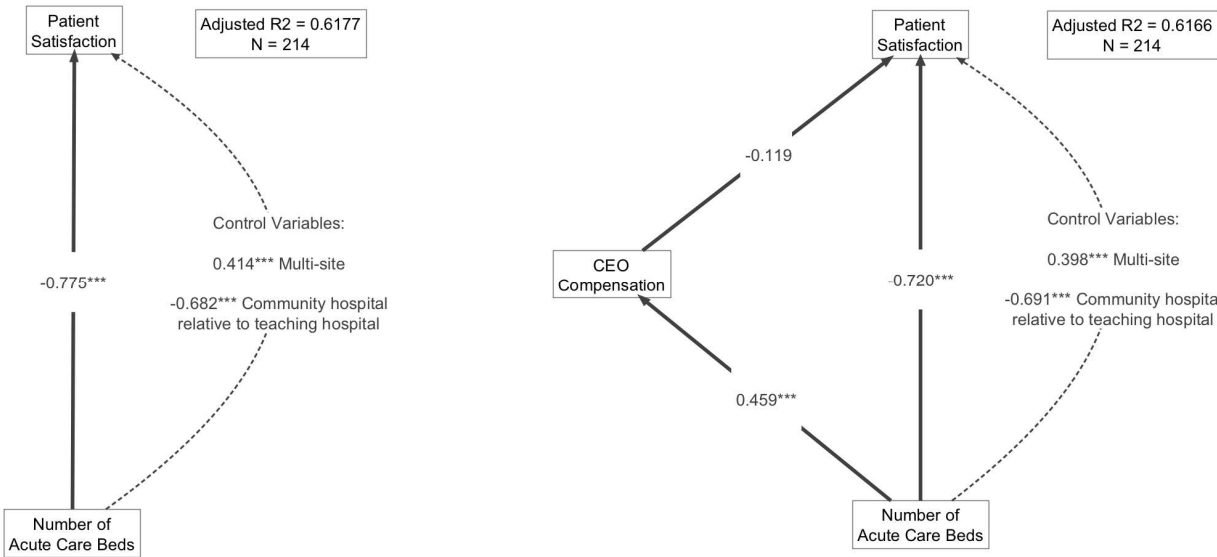
Table 4: Linear regression of the natural logarithm of lagged annual CEO compensation on the square root of acute care beds^{a, b}

Independent variables	Model V
Constant	12.097*** (0.101)
Acute care beds	0.0482*** (0.003)
Year 2005 relative to 2007	- 0.066* (0.028)
Year 2006 relative to 2007	- 0.058* (0.027)
Multi-site	- 0.069* (.0027)
Community hospital relative to teaching	- 0.432*** (0.065)
Small hospital relative to teaching	- 0.629*** (0.083)
Model statistics	
N	261
Adjusted R ²	0.8644
F-statistic	298.25***

^a Negative coefficients indicate a lower compensation relative to that of a teaching hospital CEO in 2006. Robust standard errors are in brackets.

^b *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$.

Figure 1: Number of acute care beds and patient satisfaction performance: Direct relationship and relationships as mediated by CEO compensation ^{a,b}



^a Negative coefficients indicate the variable lowers the level of patient satisfaction.

^b *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$.